

Serial No. 10/751,342
Docket No. 53311-US-CNT

AMENDMENTS TO THE CLAIMS

Please amend the claims as shown.

As amended, the following listing of claims will replace all prior versions and listings of claims in the application.

1. (previously presented) A method of providing therapy against a pulmonary fungal infection, the method comprising:

determining a minimum inhibitory concentration of an antifungal agent for inhibiting a specific pulmonary fungal growth; and

administering by inhalation directly to the lungs of a patient a powder aerosolized pharmaceutical formulation comprising an antifungal agent having efficacy against said pulmonary fungal growth, wherein the powder comprises porous particles, and is characterized by a mass median aerodynamic diameter of less than about 5 microns and a bulk density of less than about 0.5 g/cm³, the powder formulation being administered in a first dosage, followed after a predetermined time interval, by a second dosage, said first dosage being greater than said second dosage;

wherein a sufficient amount of the pharmaceutical formulation is administered to maintain for at least one week a target antifungal agent lung concentration of at least two times the determined minimum inhibitory concentration.

2. (original) A method according to claim 1 wherein the minimum inhibitory concentration is the minimum inhibitory concentration in the epithelial lining of the lung.

3. (original) A method according to claim 1 wherein the minimum inhibitory concentration is the minimum inhibitory concentration in the solid tissue of the lung.

4. (original) A method according to claim 1 wherein the target antifungal agent lung concentration is maintained for at least two weeks.

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5. (original) A method according to claim 1 wherein the target antifungal agent lung concentration is maintained for at least three weeks.
6. (original) A method according to claim 1 wherein the target antifungal agent lung concentration is maintained for at least one month.
7. (original) A method according to claim 1 wherein the target antifungal agent lung concentration is maintained for at least three months.
8. (original) A method according to claim 1 wherein the administration comprises delivering a single dose of the pharmaceutical formulation during the first week of administration.
9. (original) A method according to claim 1 wherein the administration comprises delivering at least two doses of the pharmaceutical formulation during the first week of administration.
10. (original) A method according to claim 1 wherein the administration comprises a first administration period and a second administration period and wherein the antifungal agent is administered more frequently or at a higher dosage during the first administration period than during the second administration period.
11. (original) A method according to claim 1 wherein the antifungal agent is amphotericin B.
12. (original) A method according to claim 11 wherein the target antifungal lung concentration is at least 9 $\mu\text{g/g}$.
13. (original) A method according to claim 11 wherein the target antifungal lung concentration is a range of concentrations from 4.5 $\mu\text{g/g}$ to 20 $\mu\text{g/g}$ and wherein the administration comprises delivering the pharmaceutical formulation periodically to

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maintain the antifungal agent lung concentration within the target antifungal lung concentration range.

14. (original) A method according to claim 13 wherein the target antifungal lung concentration is from 9 to 15 $\mu\text{g/g}$.

15. (original) A method according to claim 1 wherein the antifungal agent comprises one or more of amphotericin B, nystatin, hamycin, natamycin, pimarin, ambruticin, acrisocin, aminacrine, anthralin, benanomicin A, benzoic acid, butylparaben, calcium undecyleneate, candicidin, ciclopirox olamine, cilofungin, clioquinol, clotrimazole, ecaonazole, fluconazole, flucytosine, gentian violet, griseofulvin, haloprogin, ichthammol, iodine, itraconazole, ketoconazole, voriconazole, miconazole, nikkomycin Z, potassium iodide, potassium permanganate, pradimicin A, propylparaben, resorcinol, sodium benzoate, sodium propionate, sulconazole, terconazole, tolnaftate, triacetin, undecyleneic acid, monocyte-macrophage colony stimulating factor (M-CSF), zinc undecylenateand, and pharmaceutically acceptable derivatives and salts thereof.

16 - 17. (cancelled).

18. (original) A method according to claim 1 wherein the pharmaceutical formulation comprises particles comprising the antifungal agent and a matrix material.

19. (original) A method according to claim 18 wherein the matrix material comprises one or more phospholipids.

20. (original) A method according to claim 1 wherein the administration comprises delivering the pharmaceutical formulation in dry powder form using a dry powder inhaler.

21-22. (cancelled)

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23. (previously presented) A method of providing therapy against a pulmonary fungal infection comprising an aspergillosis, the method comprising:

administering by inhalation directly to the lungs of a patient an aerosolized pharmaceutical formulation comprising amphotericin B, wherein the formulation comprises porous particles characterized by a mass median aerodynamic diameter of less than about 5 microns and a bulk density of less than about 0.5 g/cm³, and;

wherein a sufficient amount of the pharmaceutical formulation is administered to maintain for at least two weeks a target amphotericin lung concentration of at least 9 µg/g, and wherein the administration comprises a first administration period and a second administration period and wherein the amphotericin B is administered more frequently or at a higher dosage during the first administration period than during the second administration period.

24. (original) A method according to claim 23 wherein the amphotericin B concentration is the concentration in the epithelial lining of the lung.

25. (original) A method according to claim 23 wherein the amphotericin B concentration is the concentration in the solid tissue of the lung.

26-27. (cancelled)

28. (original) A method according to claim 23 wherein the target amphotericin B lung concentration is maintained for at least one month.

29. (original) A method according to claim 23 wherein the target amphotericin B lung concentration is maintained for at least three months.

30. (original) A method according to claim 23 wherein the administration comprises delivering a single dose of the pharmaceutical formulation during the first week of administration.

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31. (original) A method according to claim 23 wherein the administration comprises delivering at least two doses of the pharmaceutical formulation during the first week of administration.

32-37. (Cancelled)

38. (original) A method according to claim 23 wherein the pharmaceutical formulation comprises particles comprising the antifungal agent and a matrix material.

39. (original) A method according to claim 38 wherein the matrix material comprises one or more phospholipids.

40. (original) A method according to claim 23 wherein the administration comprises delivering the pharmaceutical formulation in dry powder form using a dry powder inhaler.

41-62. (cancelled)

63. (previously presented) A method of providing therapy against a pulmonary lung infection, the method comprising:

determining the minimum inhibitory concentration of an antifungal agent for inhibiting at least one specific pulmonary fungal growth;

administering an aerosolized pharmaceutical formulation comprising the antifungal agent by inhalation directly to the lungs of a patient, wherein the amount of the pharmaceutical formulation administered is sufficient to achieve a target antifungal agent lung concentration that is greater than the determined minimum inhibitory concentration;

thereafter administering an immunosuppressive agent to the patient for a period of time; and

maintaining the target antifungal agent lung concentration throughout the period of time.

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64. (original) A method according to claim 63 wherein the minimum inhibitory concentration is the minimum inhibitory concentration in the epithelial lining of the lung.

65. (original) A method according to claim 63 wherein the minimum inhibitory concentration is the minimum inhibitory concentration in the solid tissue of the lung.

66. (original) A method according to claim 63 wherein the administration comprises delivering at least two doses per week of the pharmaceutical formulation before the administration of the immunosuppressive agent and wherein the target concentration is maintained by administering doses of the pharmaceutical formulation less frequently.

67. (original) A method according to claim 63 wherein the antifungal agent is amphotericin B.

68. (original) A method according to claim 67 wherein the target antifungal lung concentration is at least 4.5 µg/g.

69. (original) A method according to claim 67 wherein the target antifungal lung concentration is a range of concentrations from 4.5 µg/g to 20 µg/g and wherein the administration comprises delivering the pharmaceutical formulation periodically to maintain the antifungal agent lung concentration within the target antifungal lung concentration range.

70. (original) A method according to claim 67 wherein the target antifungal lung concentration is from 9 to 15 µg/g.

71. (original) A method according to claim 63 wherein the antifungal agent comprises one or more of amphotericin B, nystatin, hamycin, natamycin, pimarin, ambruticin, acrisocin, aminacrine, anthralin, benanomicin A, benzoic acid, butylparaben, calcium undecyleneate, candicidin, ciclopirox olamine, cilofungin, clioquinol, clotrimazole,

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ecaonazole, flucanazole, flucytosine, gentian violet, griseofulvin, haloprogin, ichthammol, iodine, itraconazole, ketoconazole, voriconazole, miconazole, nikkomycin Z, potassium iodide, potassium permanganate, pradimicin A, propylparaben, resorcinol, sodium benzoate, sodium propionate, sulconazole, terconazole, tolnaftate, triacetin, undecyleneic acid, monocyte-macrophage colony stimulating factor (M-CSF), zinc undecylenateand, and pharmaceutically acceptable derivatives and salts thereof.

72. (original) A method according to claim 63 wherein the pharmaceutical formulation has a bulk density of less than 0.5 g/cm³.

73. (original) A method according to claim 63 wherein the pharmaceutical formulation comprises hollow and/or porous particles.

74. (original) A method according to claim 63 wherein the pharmaceutical formulation comprises particles comprising the antifungal agent and a matrix material.

75. (original) A method according to claim 74 wherein the matrix material comprises one or more phospholipids.

76. (original) A method according to claim 63 wherein the administration comprises delivering the pharmaceutical formulation in dry powder form using a dry powder inhaler.

77. (original) A method according to claim 63 wherein the pharmaceutical formulation comprises a propellant and wherein the administration comprises aerosolizing the antifungal agent by opening a valve to release the pharmaceutical formulation.

78. (original) A method according to claim 63 wherein the pharmaceutical formulation is a liquid and wherein the administration comprises aerosolizing the liquid using a compressed gas and/or a vibrating member.

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79 – 96. (cancelled)

97. (withdrawn) A unit dose receptacle comprising an aerosolizable pharmaceutical formulation for delivering from 5 mg to 10 mg of amphotericin B when aerosolized.

98. (previously presented) The method of claim 1 wherein the fungal infection comprises aspergillosis, blastomycosis, disseminated candidiasis, coccidioidomycosis, cryptococcosis, histoplasmosis, mucormycosis, sporotrichosis and combinations thereof.

99. (currently amended) The method of claim [[23]] 63 wherein the fungal infection comprises aspergillosis, blastomycosis, disseminated candidiasis, coccidioidomycosis, cryptococcosis, histoplasmosis, mucormycosis, sporotrichosis and combinations thereof.

100. (new) The method of claim 1 wherein, two days following administration, a concentration of antifungal agent in the lungs is at least about 150 times a concentration of antifungal agent in the lungs delivered intravenously, and wherein a concentration of antifungal agent in the serum is substantially zero.

101. (new) The method of claim 23 wherein, two days following administration, a concentration of amphotericin-B in the lungs is at least about 150 times a concentration of amphotericin-B in the lungs delivered intravenously, and wherein a concentration of amphotericin-B in the serum is substantially zero.